At page 23, line 343, delete "Polymer Composition No. 6" insert -- Polymer Composition No. 8 --.

DISCUSSION OF AMENDMENTS

Claims 1 and 12 and the disclosure have been amended to provide the correct chemical formula for the acrylic acid compound. The correct formula is CH_2=CR–COOH. The formula as filed, CH_2=CRH–COOH, is not correct. The invention disclosed and claimed herein is clearly stated, for example at page 4, lines 73-84, as involving an acrylic acid compound. This change is a "house-keeping" amendment and does not involve new matter. Entry of the amendment is respectfully requested.

Claim 12 and the disclosure have been changed to replace the term "ammonia" and the formula for ammonia, NH_3, with the term "ammonium" and the formula for ammonium, NH_4. Ammonia, at ordinary temperature and pressure, is a gas. Ammonia, when dissolved in water, occurs in ionic form as the ammonium ion. It is clear from the structure shown in the disclosure at page 7, line 138, that the ionic form of ammonia is disclosed. This change is a "house-keeping" amendment and does not involve new matter. Entry of the amendment is respectfully requested.

The disclosure has been amended at page 23, line 343, to change the phrase "Polymer Composition No. 6" to "Polymer Composition No. 8." The disclosure at page 3, lines 53-58, cites examples of prior art compositions. In Example 6, a water soluble composition, identified as Polymer Composition No. 8, was prepared. The composition corresponds to cited prior art compositions. Polymer Composition No. 8 is not an example of the water soluble composition of this invention. Polymer Composition No. 6 is an example of the water soluble composition of this invention. In this regard note Example 3 at page 19.

ARGUMENTS

THE INVENTION

This invention provides a water soluble polymer composition which is a copolymer comprised of random repeat units of an acrylic acid compound and random repeat units of a divalent metal salt of the acrylic acid compound. This invention also provides a water soluble polymer composition which is a terpolymer comprised of random repeat units of an acrylic acid compound, random repeat units of a divalent metal salt of the acrylic acid compound, and random repeat units of a monovalent metal salt of the acrylic acid compound. In one embodiment, the acrylic acid compound is acrylic acid, the divalent metal salt of the acrylic acid compound is magnesium acrylate and the monovalent metal salt of the acrylic acid compound is sodium acrylate. (Disclosure, page 4, lines 72- 84)

The water soluble polymer composition of this invention can be made by combining a quantity of divalent metal salt with an acrylic acid compound, and it can be made by combining a quantity of divalent metal salt and a quantity of monovalent metal salt with an acrylic acid compound. The composition, accordingly, must include a quantity of divalent metal compound. In this regard, the ratio of divalent metal compound to acrylic acid compound is an amount in the range of from about 0.15 to about 0.5 ... moles divalent metal compound per mole of acrylic acid compound, and the ratio of monovalent metal compound to acrylic acid compound is an amount in the range of from about 0.0 to about 0.5 moles metal compound per mole of acrylic acid compound. (Disclosure, page 8, lines 169- 177; Claims 12, 16)

The combination of ingredients in the water soluble composition of this invention is stated in stoichiometric terms in connection with Formula 1 as being in the range of from 0 to about 2.25 units of monovalent metal salt of acrylic acid compound per unit of acrylic acid

compound and from about 0.65 to about 2.75 units of divalent metal salt of acrylic acid compound per unit of acrylic acid compound.(Disclosure page 7, lines 135-148; Claims 1, 14)

This invention still further provides a cross linked acrylic acid polymer which is water insoluble and stable at temperatures up to about 450°F. The cross linked acrylic acid polymer, a water insoluble gel, is made by reacting the water soluble polymer composition of this invention with a suitable cross linking agent. The water insoluble gel of this invention is useful as a water shut-off and profile modification material. (Disclosure, page 5, lines 102- 106)

THE ART REJECTION

The rejection of claims 1-8 and 12-16 under 35 USC 102(b) as being anticipated by Miyake et al., US Patent 6,399,668 is traversed for the following reasons.

The Examiner, specifically relying on Miyake, Col. 12, lines 10-24, states, "Miyake teaches a gelling water absorbent material prepared by radical polymerization of acrylic acid and sodium acrylate."

Claims 1, 2 and 6 are drawn to a method of making a water soluble polymer of an acrylic acid compound. Claims 3, 4, 5, 7 and 8 are drawn to method of making a water insoluble gel by reacting the water soluble polymer of claim 2 with a cross linking agent.

Claims 12 and 13 are drawn to a method of making a water soluble polymer.

Claims 14 and 15 are drawn to a method of adjusting the permeability of a subsurface formation by introducing into the formation a gel which is not water soluble, wherein the gel is formed by first making a water soluble polymer and then combining the water soluble polymer with a cross linking agent.

Claim 16 is drawn to a method of adjusting the permeability of a subsurface formation by introducing into the formation a gel which is not water soluble, wherein the gel is made by first polymerizing a water soluble polymer and then cross linking the water soluble polymer.

Regarding claim group A (claims 1-8), Miyake does not disclose a method of making a water soluble polymer of an acrylic acid compound and then reacting the water soluble polymer with a cross linking agent to make a water insoluble gel.

Regarding claim group B (claims 12-13), Miyake does not disclose a method of making a water soluble polymer of an acrylic acid compound.

Regarding claim group C (claims 14-15), Miyake does not disclose a method of adjusting the permeability of a subsurface formation by introducing into the formation a gel which is not water soluble, wherein the gel is formed by first making a water soluble polymer and then combining the water soluble polymer with a cross linking agent.

Regarding claim group D (claim 16), Miyake does not disclose a method of adjusting the permeability of a subsurface formation by introducing into the formation a gel which is not water soluble, wherein the gel is made by first polymerizing a water soluble polymer and then cross linking the water soluble polymer.

Claim groups C and D are not anticipated and are in condition for allowance.

Claims 14-16 are in condition for allowance without further comment. It is clear that Miyake does not disclose any method of adjusting the permeability of a subsurface formation. Reconsideration and allowance are requested.

Claims 1, 2 and 6 are not anticipated and are in condition for allowance.

With regard to claims 1, 2 and 6, Miyake does not disclose a method of making a water soluble polymer. Miyake does not disclose combining an acrylic acid compound (such as acrylic acid), with a reactant selected from the group consisting of a divalent metal salt of the acrylic acid compound (such as magnesium acrylate), a monovalent metal salt of the acrylic acid compound (such as an alkali metal acrylate) and mixtures thereof to form the water soluble

polymer, wherein the water soluble polymer must include, as one element, an acrylic acid compound, and, as a second element, a divalent metal salt of the acrylic acid compound.

In contrast, Miyake specifically discloses making a water-absorbent resin which is water insoluble (Col. 3, lines 1-2). A preferred water insoluble product of Miyake is a partially neutralized crosslinked polymer of polyacrylic acid (Col. 4, lines 58 and 59; Col. 5, lines 7 and 8). The water insoluble product of Miyake is made by polymerizing an acrylic acid monomer (Col. 5, lines 12-24). The portion of Miyake cited by the Examiner (Col. 12, lines 10-24) recites a reaction mixture of acrylic acid, sodium acrylic acid, water, trimethylolpropane triacrylate, ammonium persulfate and sodium hydrogen sulfate. Miyake reports that a "water-containing gell-like polymer obtained at a peak of the polymerization was a finally divided polymer.." (Lines 25-29). The finally divided polymer produced was not water soluble.

It is clear that Miyake does not include a divalent metal salt of the acrylic acid compound in his polymerization mixture. Such an inclusion produces a polymer which is water soluble.

Claims 3, 4, 5, 7 and 8 are not anticipated and are in condition for allowance.

With regard to claims 3, 4, 5, 7 and 8, Miyake does not disclose combining his water-absorbent resin which is water insoluble with a cross linking agent (such as a trivalent metal) to form a water insoluble gel.

In contrast, Applicant claims the step of combining his water soluble polymer with a cross linking agent (such as a trivalent metal) to form the water insoluble gel.

Claims 12 and 13 are not anticipated and are in condition for allowance

With regard to claims 12 and 13, Miyake does not disclose a method of making a water soluble polymer by mixing an acrylic acid compound (such as acrylic acid), with a material selected from the group consisting of a divalent metal compound (such as magnesium hydroxide), a monovalent metal compound (such as sodium hydroxide) and mixtures thereof to

form a polymer precursor, wherein the divalent metal compound must be present. Miyake does not disclose combining the precursor with a polymerization initiator (such as free radical initiator) to form the water soluble polymer.

Claims 14 and 15 are not anticipated and are in condition for allowance.

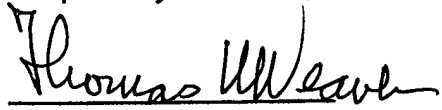
With regard to claims 14 and 15, Miyake does not disclose a method of adjusting the permeability of a subsurface formation by any means, including introducing a water insoluble gel into the formation. Miyake does not disclose making the gel by combining acrylic acid with a reactant selected from the group consisting of an alkaline earth metal salt of acrylic acid, an alkali metal salt of acrylic acid and mixtures thereof to form a polymer precursor; combining the precursor with a polymerization initiator (such as free radical initiator) to form a water soluble polymer; and combining the polymer with a cross linking agent to form the gel.

Claim 16 is not anticipated and is in condition for allowance.

With regard to claim 16, Miyake does not disclose a method of adjusting the permeability of a subsurface formation by any means including introducing a water insoluble gel into the formation. Miyake does not disclose making the gel by mixing acrylic acid with a material selected from the group consisting of magnesium hydroxide, sodium hydroxide and mixtures thereof to form a polymer precursor; combining the precursor with a polymerization initiator (such as free radical initiator) to form a water soluble polymer; and combining the polymer with a cross linking agent to form the gel.

This application is in condition for allowance. Reconsideration and allowance are requested.

Respectfully submitted,



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CERTIFICATE OF MAILING

I hereby certify that the within and foregoing document, together with the attachments referred to therein, if any, is being deposited by the undersigned with the United States Postal Service as first class mail in an envelope, with sufficient postage, addressed to the Commissioner For Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450 on June 26, 2006.

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